Amendment to the Basin Plan for the Control of Nutrients in Clear Lake
Response to Public Comments

The Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) has provided opportunities for the public to submit written comments on the April 2006 Staff Report. This document contains written responses to comments received as of 24 May 2006.

Written Comments received prior to the 22/23 June Hearing from:

A. Chuck Marsh, Lake County Farm Bureau. Comments 1-4.
B. Robert Lossius, County of Lake, Public Works Department. Comments 5-14

1. Comment: *It appears that the Regional Board is unnecessarily melding the Interim Irrigated Lands Waiver (Interim Waiver) as a vehicle for the monitoring and reporting of nutrient loading into surface waters flowing into Clear Lake.*

   Response: The proposed program avoids unnecessary duplication by taking advantage of an existing regulatory program to implement the Basin Plan Amendment. This is a common practice that has been used with other pollutant control programs that have been adopted by the Regional Board. Dischargers have typically preferred to be regulated through one coordinated program, rather than having to respond to requirements from different programs with overlapping jurisdiction

   We have provided alternative basin plan language for Board consideration that would take advantage of the existing watershed/water quality framework that exists in the county. Under this approach, the county would coordinate the program elements and interact with the Interim Waiver program, as needed.

2. Comment: *Agricultural operations subject to the Interim Waiver within the Clear Lake Basin are interspersed with a multitude of other land uses. For instance, it is common to have in one sub area family farms, rural residences with septic tanks, family gardens, aesthetic ponds with high concentrations of wildlife, horse pastures, and other nutrient potential sources. As a practical matter, this makes it financially infeasible and impractical to individually evaluate any potential source contributions form our family farms and ranches. We therefore believe that the monitoring and estimations of load content that will be conducted by the County of Lake will include those irrigated agricultural lands currently enrolled as participants in our watershed group.*

   Response: The phosphorus loading estimates can be done using either monitoring or computer modeling or a combination of the two. In this case

computer modeling may be more appropriate. This would reduce the costs associated with estimating loads. The Regional Board has funding for Tetra Tech to estimate the phosphorus loads from the different identified responsible parties. This baseline study will provide the initial information needed for the estimation of source contributions. The loading estimates will need to be updated as practices are implemented to control erosion. Regional Board staff will work with the Farm Bureau to ensure that the results of the Tetra Tech study are available and that the model can be updated as necessary. We are interested in figuring out how to evaluate contributions from all significant sources.

3. Comment: *We have major concerns with this type of program being required for our watershed group as a whole. Many of our members do not farm within the drainage of Clear Lake. We would be presented an unworkable program to separate those growers from ones whose operations do flow into the lake. The management of such a program would not be economically feasible, as monitoring costs would need to be increased to unbearable levels due the limited acreages within the different sub-watersheds of the Clear Lake basin.*

   Response: As mentioned in the response to Item #2 above, Regional Board staff has a contract with Tetra Tech to conduct a baseline estimate of phosphorus loading from each source. The requirements of the Basin Plan Amendment could be met by working within this modeling framework. Extensive water quality monitoring likely would not be required unless the modeling approaches do not provide the information needed for us to make reasonable decisions about the algae problems in the lake.

4. Comment: *Lake County's irrigated agricultural lands are interspersed with many rural residential ranchettes that do not irrigate for the purpose of marketing their commodity. Out of 2027 parcels zoned agriculture, over 600 are 5 acres and less. The majority of these parcels and owners are not currently included in our waiver program, as they do not irrigate a commercial agricultural commodity. We see this proposed implementation program as a penalty for those that have worked to stay in production agriculture.*

   Response: The implementation program was not designed to be a penalty for any responsible party. The program was designed to work within the existing regulatory framework. See also the response to Item #1 above. We are interested in all the potential discharges from agricultural lands. However, if we request information under the Irrigated Lands Waiver Program, we would only expect information from lands that are part of the waiver.

5. Comment: *The County's major concern is the information utilized to justify the TMDL does not reflect the current conditions in Clear Lake. The clarity of the lake has increased significantly since 1990*

Response: Lake levels have been average or above average for most years since the early 1990s. The historical monitoring data show that some of the worst algae blooms were observed during drought or below average lake level years. Therefore, until we have a series of low water years, it is premature to assume that the problem has been fixed. Even in this era of relatively few blooms, some years are significantly worse than others and there might not be total agreement that the existing water quality conditions are unimpaired. The proposed Basin Plan Amendment recommends additional studies to define the conditions in Clear Lake that constitute impairment.

6. *Comment: Review of available data collected by the Department of Water Resources (DWR) through 2001 indicated in-lake levels of phosphorus have not changed significantly from the pre-1990 period but the lake is clearer*

   Response: Previous research and studies on the lake have acknowledged that there are multiple factors that influence the occurrence of nuisance blooms in the lake. However, all those studies also concluded that phosphorus was one of the factors and that the most reasonable control program was to reduce phosphorus loads. The peer reviewers for the proposed amendment echoed the same conclusion and one recommended that we also look at other factors.

   The proposed amendment recognizes the need to continue to look at the other factors that influence algae growth in the lake. It does not require anyone to immediately change practices to accomplish phosphorus reductions. The proposed amendment requires responsible parties to submit to the Regional Water Board information on the practices that are being implemented, an assessment of their effectiveness, estimates of the phosphorus loading, and monitoring in the lake to confirm present conditions. It also recognizes the need for studies to evaluate the roles of other factors in influencing the incidence of nuisance blooms. This information will be used to determine whether any reductions are needed and to verify whether assumptions made in the TMDL are accurate.

   The Central Valley Water Board will be considering alternative Basin Plan Amendment language during the June hearing. It states that the phosphorus load and waste load allocations would only apply if the results of the studies confirmed that phosphorus is indeed the driving factor behind algae growth in the lake. If it were found that there is another cause, the phosphorus load and waste load allocations would no longer apply.

7. *Comment: Without an update of the Clean Lakes Study …it is difficult to determine whether Clear Lake, a naturally eutrophic lake, is water quality limited and whether a Total Maximum Daily Load is required or that phosphorus limitation will increase the lake clarity.*

Response: Staff agrees that an update of the Clean Lakes study would be useful. Both the original Basin Plan Amendment and the alternative Basin Plan Amendment call for further study to gain a better understanding of the factors that affect algae growth in Clear Lake. In the interim, staff believes that a focus on controlling phosphorus makes sense based on the reasons discussed in #5 and #6 above.

8. Comment: *The Target Report* (Tetra Tech Report) *also appears to draw erroneous conclusions on when the lake was in "compliance". The Target Report lists the "compliance period" to be between 1985 and 1989 and the non-compliance period to be 1990 and 1992. In reality, there have been significantly fewer nuisance, blue-green algal blooms since 1991. DWR secchi depth data for the Upper Arm of Clear Lake confirm this, with secchi depths averaging 0.9 meters during 1985 through 1990, and averaging 1.7 meters during 1991 through 1992, the "non-compliant" years … Since 1991, the Upper Arm secchi depth has averaged 2.1 meters. How is a lake with double the clarity of the "compliant" lake "non-compliant"?*

   Response: The non-compliant years were 1985-1989 and the compliant years were 1990-1991. Severe algal blooms were documented in 1990 and 1991 (Richerson et. al., 1994), even though Secchi depth measurements during 1991 were higher than previous years. Water clarity cannot be expected to track perfectly with average algae density or modeled chlorophyll values, especially over a short period and with clarity measurements occurring only at monthly intervals. Nuisance algae blooms may only last several days and may occur in patches located away from the established sampling sites. It would be easy to miss a significant bloom if sampling was not conducted at the exact time and location where the bloom was occurring. The simulated chlorophyll-a values during the "compliant" and "non-compliant" years were based on a calibrated water quality model that considered multiple factors such as nutrient cycling, dissolved oxygen levels, mixing and residence time. These values are our best estimate of daily conditions in the lake.

9. Comment: *The Target Report also recommends that chlorophyll-a be utilized in determining whether Clear Lake is in compliance. There is very little historical data on chlorophyll-a levels in Clear Lake, therefore, the models used in preparation of the Target Report are unverifiable and we are unable to determine whether the recommended target is appropriate.*

   Response: Limited chlorophyll-a data do exist for Clear Lake. A study of the algae conducted in 1975 (Horne, 1975) measured chlorophyll-a levels as high as 15,000 ug/L during blooms. The proposed target of 73 ug/L represents an improvement on these conditions. Regional Water Board staff collected chlorophyll-a data from April through October 2005. The past summer was generally considered a low nuisance bloom year. Chlorophyll-a levels were

below 73 ug/L except for the month of August when a peak of 103 ug/L was measured in the Upper Arm. We are committed to working with the County to determine whether chlorophyll-a is the best parameter to use as a target or whether some other parameter would be a better measure of impairment (i.e., clarity, algae density or nuisance bloom frequency). When to the Regional Water Board reevaluates the program in five years, staff will re-consider the appropriateness of the chlorophyll-a target.

10. Comment: *Without a good understanding of the causes of the changes in lake clarity that occurred in 1991, it is not clear how much, if any, change in phosphorus inputs will change lake clarity and the frequency and magnitude of blue-green algal blooms. Regional Board staff understood our concerns with the Target Report and included the need to update the understanding of Clear Lake limnology in Action No. 7 of the proposed Basin Plan Amendments.*

    Response: Additional studies are recommended as part of the original Basin Plan Amendment and the alternative Basin Plan Amendment. These studies would be designed to determine if factors other than phosphorus levels have an impact on algae growth in the lake.

11. Comment: *The county concurs with the recommendations of Regional Board staff that reducing erosion within the Clear Lake watershed is probably beneficial to Clear Lake, however we feel any numeric targets are inappropriate until further studies are completed.*

    Response: Staff recognizes that there is some uncertainty regarding the chlorophyll-a target. For that reason staff chose not to incorporate the target into the Basin Plan as a water quality objective. The target represents a goal that will be evaluated over the years as new information is gathered on the lake. Staff believes that the numeric target represents a reasonable goal for Clear Lake. It is based on a modeling exercise that utilized over 30 years of water quality monitoring data from the lake. The models are part of the EPA's "TMDL Toolbox" and have been used to develop TMDLs throughout the country. This target would be reevaluated when the Regional Board reviews the program five years after adoption of the Basin Plan Amendment.

12. Comment: *Since the County began implementing erosion control measures in 1981 with the passage of the Grading Ordinance and the Surface Mining Ordinance, erosion and sediment delivery to Clear Lake has probably been reduced (the County did not monitor sediment and phosphorus concentrations in Clear Lake tributaries prior to 1991 and does not have data). This may be one of the causes of the increased clarity in Clear Lake since 1991.*

Response: Staff is in agreement that the County's actions may have improved clarity in Clear Lake. Hopefully, no additional actions are needed and nuisance algae blooms will not be a problem in the future. However, we are not convinced that the nuisance algae bloom problem in the lake has been eliminated. (See responses to Items #5 and #6 above). We still need to quantify the improvements in phosphorus loading and determine the impairment status of the lake during different water year types.

13. Comment: *Studies by UC-Davis researchers have indicated there may be other causes to changes in lake clarity.*

    Response: Staff agrees with this statement. The original Basin Plan Amendment and the alternative Basin Plan Amendment call for further study to better understand the factors affect algae growth in the lake. See response to #10 above.

14. Comment: *The County is concerned about the ability of a small rural county to fund the mandates of the proposed Basin Plan Amendments …Some specific concerns include … the monitoring costs to demonstrate the phosphorus loading are significant … the implementation of BMP's is estimated at $4 to $18 million. These costs are substantial … The costs for updating the Clear Lakes study are significant …*

    Response: We have been working with the county and responsible parties to keep the monitoring and reporting as reasonable as possible. We want to implement a program that is as efficient and as cost effective as possible. As was mentioned in Item #6, we are not asking anybody to immediately change practices to accomplish reductions. The County and other organizations have already implemented practices that may go a long way toward addressing the problems.

    The proposed Basin Plan Amendment requires responsible parties to submit information on the practices that are being implemented, an assessment of their effectiveness, estimates of the phosphorus loading and monitoring in the lake to confirm present conditions. This information will be used to determine whether any reductions are needed and to verify whether our TMDL assumptions are accurate. No reports are due until five years after the adoption of the Basin Plan Amendment and most of the information requested is already planned to be collected. The County has a Proposition 13 grant to monitor for mercury and nutrients in the Clear Lake watershed. DWR conducts ongoing monitoring in the lake to document trends in water quality. If for some reason this monitoring does not continue, then we will work with the county and local stakeholders and figure out how to get this information. The Regional Board has funding for Tetra Tech work to conduct a baseline estimate of phosphorus loads from each of the responsible parties.

The original Basin Plan Amendment language states that the Executive Officer will request information from the responsible parties (County, Stormwater permittees, BLM, Forest Service, Caltrans and irrigated agriculture) individually using the authority in Porter-Cologne. The alternative Basin Plan language directs the responsible parties to work together to address implementation of the Basin Plan Amendment. This alternative approach could be more cost effective because it would allow the responsible parties to leverage resources and reduce duplication.

The County estimated that the cost of additional studies to investigate the role of other constituents in promoting algae blooms in the lake to be $400,000. Regional Board staff will work with the County and other responsible parties to identify funding for this work.

Best Management Practices (BMPs) would only be required if it is determined that additional implementation actions are necessary to achieve beneficial uses in Clear Lake. If that were the case, staff would work with the responsible parties to identify funding for BMP implementation.

References:

Horne, A.J. 1975. The Ecology of Clear Lake Phytoplankton. Lakeport: Clear Lake Algal Research Unit. 116 pp.

Richerson, Peter J. et. al. 1994. The Causes and Control of Algal Blooms in Clear Lake, Clean Lakes Diagnostic/Feasibility Study for Clear Lake, California. Report prepared for Lake County Flood Control and Water Conservation District, California State Water Resources Control Board, and the US Environmental Protection Agency.